Having thus described the invention, what is claimed as new and secured by Letters Patent is:

Claims

1. An apparatus for processing N number of input signals having a common frequency, said apparatus comprising:

at least N number of modulators for modulating N of said N number of input signals into N number of modulated signals;

a combiner for combining said modulated signals into an aggregate signal;

a demux element for decombining said aggregate signal into N number of constituent modulated signals;

at least N number of demodulators for demodulating each of said N number of constituent modulated signals into N number of recovered signals each corresponding substantially identically to one of said N number of input signals.

2. The apparatus as claimed in Claim 1 wherein said demux element includes a splitter, a delay line having one or more switches, and a phase discriminator.

3. The apparatus as claimed in Claim 2 wherein a length of cabling is placed between said combiner and said splitter.

4. The apparatus as claimed in Claim 3 wherein said length of cabling spans at least a portion of an antenna structure.

5. The apparatus as claimed in Claim 4, further including a plurality of amplifiers each located such that said input signals pass through a respective one of said plurality of amplifiers prior to passing through said at least N number of modulators.

6. The apparatus as claimed in Claim 5 wherein said input signals are forward link transmissions and said plurality of amplifiers are high power amplifiers.

7. The apparatus as claimed in Claim 5 wherein said input signals are reverse link transmissions and said plurality of amplifiers are low power preamplifiers.

8. The apparatus as claimed in Claim 4 wherein said input signals are forward link transmissions and said apparatus further includes a single high power amplifier for amplifying said aggregate signal, said high power amplifier located between said combiner and said length of cabling.

9. The apparatus as claimed in any one of Claims 6, 7, or 8 wherein said phase discriminator is a modified Wilkinson combiner and both said modulators and said demodulators utilize an orthogonal methodology.

10. The apparatus as claimed in Claim 9 wherein said orthogonal methodology includes Walsh codes.

11. The apparatus as claimed in any one of Claims 6, 7, or 8 wherein said phase discriminator is a 90° hybrid and both said modulators and said demodulators utilize an orthogonal methodology.

12. The apparatus as claimed in Claim 11 wherein said orthogonal methodology includes Walsh codes.

13. The apparatus as claimed in any one of Claims 6, 7, or 8 wherein said phase discriminator is a modified Wilkinson combiner and both said modulators and said demodulators utilize a quasi-orthogonal methodology.

14. The apparatus as claimed in any one of Claims 6, 7, or 8 wherein said phase discriminator is a 90° hybrid and both said modulators and said demodulators utilize a quasi-orthogonal methodology.

15. A method for processing N number of input signals having a common frequency, said method comprising:

obtaining N number of input signals having a common frequency;

phase-shifting each one of said input signals by a respective phase shift sequence via a modulation scheme;

combining said phase-shifted signals to form an aggregate signal;

transmitting said aggregate signal across a length of cabling;

separating said aggregate signal through a demux such that said aggregate signal is separated into constituent components each corresponding to each one of said input signals; and

demodulating each of said constituent components into N number of recovered signals each corresponding substantially identically to one of said N number of input signals.

16. The method as claimed in Claim 15 wherein said demux element includes a splitter, a delay line having one or more switches, and a phase discriminator.

17. The method as claimed in Claim 16, further including between said obtaining step and said phase-shifting step, amplifying said input signal via a plurality of amplifiers.

18. The method as claimed in Claim 17 wherein said input signals are forward link transmissions and said plurality of amplifiers are high power amplifiers.

19. The method as claimed in Claim 17 wherein said input signals are reverse link transmissions and said plurality of amplifiers are low power preamplifiers.

20. The method as claimed in Claim 16 wherein said input signals are forward link transmissions and said method further includes between said combining step and said transmitting step, amplifying said aggregate signal via a single high power amplifier.

21. The method as claimed in any one of Claims 18, 19, or 20 wherein said phase discriminator is a modified Wilkinson combiner and said modulation scheme utilizes an orthogonal methodology.

22. The method as claimed in Claim 21 wherein said orthogonal methodology includes Walsh codes.

23. The method as claimed in any one of Claims 18, 19, or 20 wherein said phase discriminator is a 90° hybrid and said modulation scheme utilizes an orthogonal methodology.

24. The method as claimed in Claim 23 wherein said orthogonal methodology includes Walsh codes.

25. The method as claimed in any one of Claims 18, 19, or 20 wherein said phase discriminator is a modified Wilkinson combiner and said modulation scheme utilizes a quasi-orthogonal methodology.

26. The method as claimed in any one of Claims 18, 19, or 20 wherein said phase discriminator is a 90° hybrid and said modulation scheme utilizes a quasi-orthogonal methodology.

27. An apparatus for processing N number of modulated input signals having a common frequency, said apparatus comprising:

a demux element for demultiplexing an amplified aggregate signal consisting of modulated forms of said input signals, said demux element including

a splitter for splitting said aggregate signal into N number of signal components each corresponding to one modulated input signal;

a delay line having one or more switches, said delay line for filtering outputs of said splitter into odd and even frequencies of said N number of signal components; and

a phase discriminator for grouping said odd and even frequencies; and N number of demodulators, each demodulator for demodulating a corresponding one of said odd and even frequencies.

28. The apparatus as claimed in Claim 27 wherein said phase discriminator is a modified Wilkinson combiner and said demodulator utilizes an orthogonal methodology.

29. The apparatus as claimed in Claim 28 wherein said orthogonal methodology includes Walsh codes.

30. The apparatus as claimed in Claim 27 wherein said phase discriminator is a 90° hybrid and said demodulator utilizes an orthogonal methodology.

31. The apparatus as claimed in Claim 30 wherein said orthogonal methodology includes Walsh codes.

32. The apparatus as claimed in Claim 27 wherein said phase discriminator is a modified Wilkinson combiner and said demodulator utilizes a quasi-orthogonal methodology.

33. The apparatus as claimed in Claim 27 wherein said phase discriminator is a 90° hybrid and said demodulator utilizes a quasi-orthogonal methodology.